

## **Biological Evaluation of the North Fork Wildfire, Mariposa/ Minarets Ranger District, Sierra National Forest**

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### Background

The North Fork Fire occurred between August 20- September 4, 2001. It burned a total of 4,135 acres northeast of the communities of North and South Fork between Malum Ridge on the west and South Fork Bluffs on the east. On September 27, 2001 Mike Price and Dave Smith, Mariposa/ Minarets District and John Pronos, Plant Pathologist, and John Wenz, Entomologist, FHP Shared Service Area, Sonora visited the fire area. The purpose of the visit was to assess the potential for tree survival as affected by fire and insect-related injury.

### Observations

Three stands were evaluated in a shaded fuel break along the edge of South Fork Bluff. The stands were generally mixed conifer. White fir and sugar pine with lesser amounts of incense-cedar, ponderosa pine and black characterized some areas while other stands were predominantly ponderosa pine with lesser amounts of sugar pine and black oak. The fuel break was created over the past 2 to 3 years in 80 to 100 year-old stands that had been railroad logged in the early 1900's. The stands were thinned using "cut-to-length" (CTL) equipment to 6 foot spacing between crowns and about 200 sq.ft./ acre basal area. The thinning involved the removal of the advanced regeneration and intermediate size classes to reduce ladder fuels. The smaller (< 6 inches diameter) residual material was left on the site following the CTL operation and was still on site at the time of the North Fork Fire. Residual diameters ranged from about 14 to 16 inches DBH to 36 inches+ DBH. Several 24 inch+ DBH white fir and sugar were present.

In many areas, the fire was crowning as it came up the ridge toward the top of South Fork Bluff. It appeared that as it crested the edge of the bluff into the shaded fuel break and where the topography flattened out, it dropped to the ground. Numerous trees on or near the edge of the bluff suffered varying levels of crown scorch but in several areas, as the fire dropped to the ground, the crowns of trees situated back from the edge of the bluff evidenced little to no crown damage. The ground was fairly uniformly covered with ash, two inches plus in depth in many locations. Bark scorch was somewhat variable, but many of the trees had scorch extending 20-30 feet up one side of the bole. In other cases, bark scorch was limited to a narrow band (< 6 inches in width) at the base of the tree often extending 75% to 100% of the bole circumference. Many of the trees, especially the large diameter white fir and sugar pine had evident bark scorch but green crowns. Although much of the residual slash had been completely consumed by the fire, partially burned woody material (slash and cut stumps) was evident in many locations, often in the vicinity of trees that evidenced bark scorch.

Several large diameter white fir and sugar pine exhibiting varying levels of bole scorch were examined for cambium damage. In almost all cases, killed cambium was found near the ground line, often affecting more than 50% of the bole circumference. There did not appear to be any correlation between bark scorch height or crown condition and cambium kill.

One 3 to 5 acre stand consisted primarily of ponderosa pine (14 inches to 22 inches DBH) that had experienced 75% to 100% crown scorch. In general, the bottom 25%-60% of these crowns had a brownish- gray color and had the appearance of being uniformly stiff or “frozen”. The upper part of the crowns did not look stiff and had a more reddish to lighter brown appearance. Bud and twigs clipped from branches in the lower crown were brittle and obviously dead. Some buds clipped from branches higher in the crown appeared to be moist and alive although some of the twigs from these branches were dry and apparently dead.

### Insects

No western pine beetle or mountain pine beetle activity was observed in the fire-injured trees (about five weeks after the burn). Very low levels of red turpentine beetle activity was noted in sugar pine. Extensive, whitish, splinterlike, boring dust was present on the boles of many large diameter white fir that had moderate to heavy bole scorch. This is likely the result of boring by ambrosia beetles, most likely *Platypus wilsoni*. *P. wilsoni* (see Biology, below) generally attacks weakened, injured, dead and dying trees.

### Discussion

Heavy fuels loads contributed to high levels of cambium kill

Marking guidelines (discuss)- important to evaluate and apply locally (fire not uniform in effects)

Consider identifying, tagging, and monitoring trees with different fire injuries to monitor marking guideline accuracy- especially ponderosa (buds) and large diameter sugar pine (cambium kill)

Shaded fuel break (and topography) appears to have worked in that fire went from crown to ground and enabled fire to be stopped at the road. Address issue of CTL generated fuels left on site for 2 to 3 years without significant decay contributed to heavy fuel loads and hot fire-cambium kill.

Continue to monitor through next field season at least (if not two) for bark beetle activity and new bud growth next spring